

ECONOMIC HANDLING OF OILFIELD PRODUCED WATERS USING A COMBINED BIOLOGICAL TREATMENT AND PHYTOREMEDIATION SYSTEM

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The oil and natural gas industry is the lifeline of the US economy. It accounts for more than 60 % of the energy consumed in the US and is now facing the challenge of satisfying the expanding thirst for energy while protecting the environment. This challenge is heightened by the increasing volumes of produced water generated in the aging oil and gas fields. The US EPA has issued a 'No Produced Water Discharge' permit action on onshore and coastal oil and gas operations. Therefore, the onshore oil and gas operations are left with only one disposal option for produced waters: subsurface reinjection. Soon the existing reinjection well capacities will not be sufficient for the growing volumes of produced water. Available alternatives include reducing the volume to be disposed and/or treating the produced water. This research outlines the proof of concept of a holistic approach for the economic handling of the produced waters through a unique treatment and land application/discharge scheme. This paper represents a plan for the development of a combination of a continuous flow activated sludge biological unit for comprehensive removal of petroleum hydrocarbons and a phytoremediation system for dissolved salts removal and volume reduction of the produced water.